

STATE OF CALIFORNIA

Budget Change Proposal - Cover Sheet

DF-46 (REV 08/15)

Fiscal Year 2016-17	Business Unit 3900	Department Air Resources Board	Priority No. 4
Budget Request Name 3900-004-BCP-BR-2016-GB		Program 3500 – MOBILE SOURCE 3510 – CLIMATE CHANGE	Subprogram

Budget Request Description
Advanced Clean Car Program

Budget Request Summary

The Air Resources Board requests \$580,000 from the Cost of Implementation Account, Air Pollution Control Fund – for 4.0 positions to continue support and further develop the Advanced Clean Cars Program including the Zero Emission Vehicle and Low Emission Vehicle elements. Additional staff is needed to fulfill the Governor's Zero Emission Vehicle Action Plan efforts as well as achieve the 2023 and 2032 air quality attainment dates and the 2030 and 2050 climate change goals. In addition to further regulatory development, staff is needed for the implementation side of the Advanced Clean Cars Program, to develop infrastructure, conduct market assessments, perform consumer outreach, and provide support to ever increasing national and international partnerships such as the International Zero Emission Vehicle Alliance.

Requires Legislation <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Code Section(s) to be Added/Amended/Repealed	
Does this BCP contain information technology (IT) components? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <i>If yes, departmental Chief Information Officer must sign.</i>	Department CIO	Date

For IT requests, specify the date a Special Project Report (SPR) or Feasibility Study Report (FSR) was approved by the Department of Technology, or previously by the Department of Finance.

☐ FSR ☐ SPR Project No. Date:

If proposal affects another department, does other department concur with proposal? ☐ Yes ☐ No
Attach comments of affected department, signed and dated by the department director or designee.

Prepared By Analisa Bevan <i>Analisa Bevan</i>	Date <i>1-7-16</i>	Reviewed By Alice Stebbins <i>Alice Stebbins</i>	Date <i>1-7-16</i>
Department Director Richard W. Corey <i>[Signature]</i>	Date <i>1/7/2016</i>	Agency Secretary Matthew Rodriguez <i>[Signature]</i>	Date <i>1-7-16</i>

Department of Finance Use Only

Additional Review: ☐ Capital Outlay ☐ ITCU ☐ FSCU ☐ OSAE ☐ CALSTARS ☐ Dept. of Technology

Type: ☐ Policy ☐ Workload Budget per Government Code 13308.05

PPBA	Original Signed By: Ellen Moratti	Date submitted to the Legislature <i>1/8/17</i>
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Analysis of Problem

A. Budget Request Summary

California's current light duty vehicle regulations require lower criteria pollutant and greenhouse gas (GHG) emissions from passenger cars and light duty trucks through 2025. Current regulations do not require any reductions after 2025. However, California will not have met health based air quality standards and will be far from reaching greenhouse gas emissions reductions targets identified for 2030 and 2050. Therefore the Air Resources Board (ARB or Board) must develop and adopt new amendments to the Low Emission Vehicle and Zero Emission Vehicle (ZEV) regulations (collectively called the Advanced Clean Car or ACC Program) beginning in 2017. In addition, as efforts have been made to implement the currently adopted ACC regulations, ARB has recognized a need for additional resources in implementation areas such as infrastructure deployment, consumer outreach, and market assessments, and coordination with other national and international entities wanting to partner with ARB on their light duty programs. ARB requests \$580,000 from the Cost of Implementation Account, Air Pollution Control Fund – for 4.0 positions to develop and implement these regulations and the complementary programs needed to achieve required criteria pollutant and greenhouse gas emissions reductions from light duty vehicles. 1.0 Air Resources Engineer (ARE) is needed to assess the performance, feasibility and costs of new vehicle technologies and to develop emissions regulations applying to vehicles in 2025 and beyond. 2.0 Air Pollution Specialists (APS) and 1.0 ARE are needed to implement complimentary programs related to infrastructure deployment, market development, and coordination with other jurisdictions. All of these positions are needed permanently because the regulations and programs will be subject to regular review, assessment, and amendment.

B. Background/History

ARB is charged with the responsibility to ensure that California achieves health based air quality standards and climate goals. These goals address multiple pollutants and have near- and long-term attainment dates. The federal Clean Air Act requires California to attain health-based ambient air quality standards. For instance, to meet the 2031 ozone standards, oxides of nitrogen, one of the key precursors in ozone and fine particle formation, must be reduced in the South Coast Air Basin and the San Joaquin Valley Air Basin by approximately 60 percent from projected baseline levels in 2031. These standards will be extremely difficult to achieve and require significant advances in vehicles and fuels.

The Global Warming Solutions Act of 2006 (AB 32): AB 32 requires the State to reduce emissions to 1990 levels by 2020, a reduction of approximately 15 percent from today's levels. A much more challenging target comes in the year 2050 by which time California aims to reduce greenhouse gas emissions to 80 percent below 1990 levels. In April 2015 Governor Brown issued Executive Order B-30-15 directing state agencies with authority over greenhouse gas emissions to adopt measures to reduce emissions to 40 percent below 1990 levels by 2030.

Existing light-duty vehicle regulations are insufficient for California to meet the health based air quality standards and greenhouse gas emission targets. To meet these requirements, nearly 100 percent of light duty vehicle sales must be zero-emission vehicles by 2050. Fuel cell electric, battery electric and plug in hybrid electric vehicles will play a critical role in achieving this goal. The remaining fleet will consist of advanced combustion engine technology vehicles operating on renewable fuels. While zero-emission vehicles are in the early stages of market deployment today, ARB needs to verify and demonstrate that the technology is ready for broad commercialization by assessing technology effectiveness, cost, availability of infrastructure, and market acceptance. ARB's technology and market assessment is crucial to justifying ongoing requirements for automakers to transition to advanced technology vehicles across the fleet.

ARB has been attempting to implement the broad reaching ACC program with a team of 8.3 permanently assigned positions, 5.0 positions loaned from other emission reduction program areas, and use of temporary positions to deal with the staffing shortage. Borrowing and redirecting staff is resulting in delay of implementation of other emission reduction programs and is not sustainable or sufficient to carry out the work needed to develop and successfully implement the ACC program in 2017 and beyond. This staffing approach is also not sufficient to accomplish the tasks necessary to meet the Governor's climate change goals for 2030 and 2050.

Analysis of Problem

Staff is engaged in technology assessment and research, regulatory implementation (e.g. tracking compliance and management of the ZEV credit bank), minor adjustments to the regulations, infrastructure assessment and planning, market assessment, consumer education, and coordination and consultation with other jurisdictions with growing ZEV requirements and markets. Much of this work will culminate in a mid-term review of the ACC program in late 2016 in which a thorough review of the technology feasibility, market, and infrastructure status will be reported to the board and published with federal partners, the federal Environmental Protection Agency, and the National Highway Traffic Safety Administration. Results of this review will set the course for emission standards from 2022 to 2025 and will have bearing on the post 2025 standards setting effort. Once the mid-term review is completed, borrowed, redirected and temporary staff will be released from the ACC program dropping the staffing by 5.0 positions.

Adopting new standards for post 2025 and developing and implementing the policies and programs needed to support the new standards and promote rapid market development will take four additional staff. One ARE is needed as a technology expert on zero emission and advanced conventional vehicle technologies. The ARE's duties will include assessment of technology effectiveness and feasibility, cost modeling, study of durability, and tracking of introduction rates of new technologies. The second engineer's duties will focus on advancing ZEV infrastructure including modeling of fueling station placement in relation to consumer demand and coverage and developing standards for fueling protocols, station certification and retail consumer acceptance.

Many of the technologies that will be used to meet longer term emission reduction goals have been in the marketplace only a few years (battery electric and plug-in hybrid vehicles), or are just now becoming available (fuel cell electric vehicles). ZEVs are currently at about three percent of new car sales. The existing ZEV regulation requires new car sales to reach approximately 15 percent by 2025. This is an unprecedented growth rate in a new vehicle technology. California needs an even more aggressive approach to market transformation to meet near term targets of about 40 percent new car sales in 2030 and nearly 100 percent by 2050. Additionally, conventional vehicle GHG emissions will need to improve substantially with continued reductions through 2050. One APS will be tasked with studying advanced clean car deployment to understand policies and measures that could increase market growth, then developing and implementing programs to achieve greater adoption of ZEVs.

One of the key factors to successful transformation of the vehicle market will be market growth outside of California. California is actively engaged in cooperative efforts with other states and countries to share best practices, partner in implementation efforts such as consumer education, develop common standards and solve technical and implementation challenges. The second APS will participate in and contribute to these growing activities.

C. State Level Considerations

The Governor's Executive Order B-16-2012 and subsequent ZEV Action Plan call for the state to engage in actions that will support and facilitate the rapid commercialization of zero-emission vehicles. The Governor's Executive Order B-30-15 establishes an interim statewide target to reduce greenhouse gas emissions 40 percent below 1990 levels by 2030 and directs state agencies to implement measures to achieve reductions of greenhouse gas emissions to meet the 2030 and 2050 targets. This proposal supports both of these priority policies by developing the regulatory programs that will ensure emissions reductions from light duty vehicles and support for the policies and programs that will be necessary to facilitate the rapid commercialization of ZEVs.

The Board has identified the ACC program as an integral part of its plans to achieve criteria pollutant and greenhouse gas emission reductions. The State Implementation Plan (SIP), being revised for submission to the U.S. EPA in 2016, will include a measure committing ARB to adopt amendments to the ACC program for emission reductions beyond 2025. Similarly the ARB's Scoping Plan update in 2016 will show that further acceleration of advanced clean cars and ZEV commercialization will be necessary to reach 2030 and 2050 greenhouse gas emissions reductions targets.

As the lead agency for establishing the ZEV market in California, ARB supports other departments in their implementation of the Governor's ZEV Action Plan assignments. Agencies such as the California

Analysis of Problem

Energy Commission, California Public Utilities Commission, Building Standards Commission and Department of General Services rely on ARB's assistance with their ZEV Action Plan tasks.

A broad community of stakeholders including state agencies, car companies, electric utilities, and other states and countries support ARB's efforts to implement the ACC program. While the car companies would prefer a market based approach to establishing the market over a regulatory approach, they support the amendment of the regulation based on sound science and analysis which can only be supported with the proper staffing levels.

D. Justification

Light duty vehicles account for approximately 20 percent of the South Coast NOx emissions and approximately 25 percent of the state's GHG emissions. The current ACC program will reduce those emissions substantially through 2030. However, these reductions are not sufficient in meeting the air quality and GHG emissions reductions targets noted above, pointing to the need for further regulations and programs to achieve long term targets.

The ACC program is an essential part of ARB's regulatory effort for achieving criteria pollutant and GHG emissions reductions targets. Merely regulating cars however is not sufficient. Regular evaluation, assessment and ongoing support are necessary to make it successful.

ARB needs to add 2.0 AREs and 2.0 APSs to the ACC program to develop and implement regulations and programs that will achieve the needed transformation of the light duty vehicle fleet to ZEVs and very low emission vehicle technologies. The ACC Program has been growing since its original development in 2012. Where ARB has employed consultant contracts and borrowed staff, it has become clear that to continue to successfully regulate light duty vehicles and support commercialization of ZEVs, in house and dedicated resources are needed.

The added personnel would allow the program to meet implementation goals while returning borrowed staff to their intended programs, reducing ARB's use of temporary help and maintain internal expertise needed to carry out technical analysis instead of using consultant contracts. If we do not add additional personnel to the program the implementation of necessary regulation development and supportive programs will be delayed or poorly implemented due to inadequate staffing. Staff borrowed from other programs will continue to cause those programs within ARB to be delayed or not implemented. These impacted programs include heavy-duty diesel in-use testing program, light-duty diesel studies, light-duty vehicle compliance programs, motorcycle regulations updates and off-road in-use compliance testing.

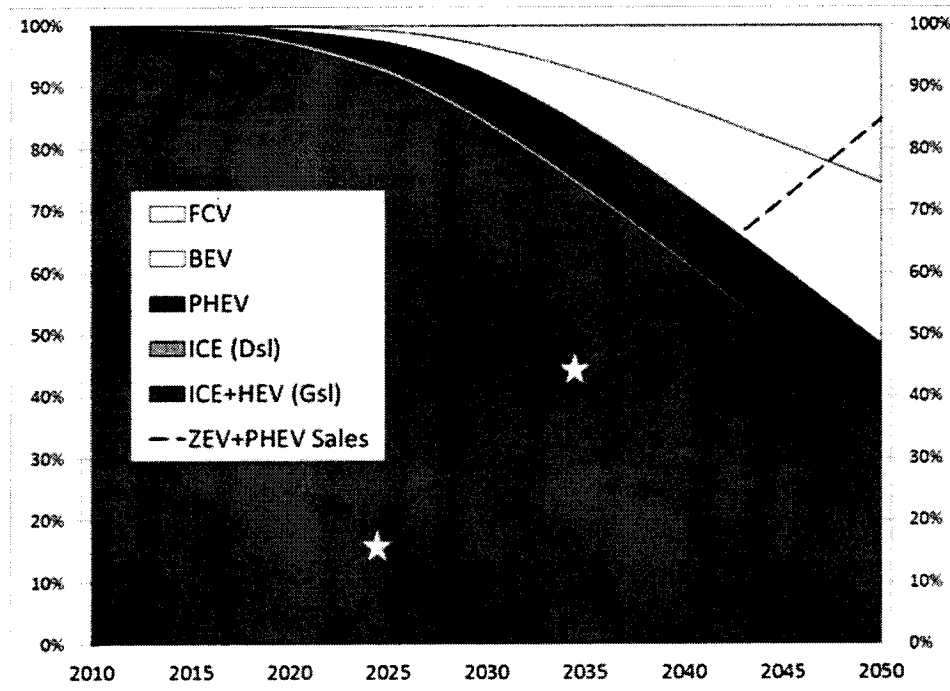
On the implementation side, deployment of an expanded infrastructure network of alternative fuels is necessary (both electric and hydrogen). Early rollout of this infrastructure has demonstrated the need for more than just stations. New best practices for siting and permitting, fueling protocols and analysis of the most efficient and effective placement of stations is needed. For example, AB 8 (Chapter 401, Statutes of 2013) requires ARB to annually evaluate projected fuel cell electric vehicle deployment and planned fueling infrastructure to ensure the State's investments in hydrogen stations are meeting growing demand.

In addition to ensuring adequate infrastructure, market uptake of ZEVs is critical. Today about 3 percent of new car sales are battery electric, plug in hybrid or fuel cell electric vehicles. This sales rate needs to grow to approximately 15 percent by 2025 and nearly 100 percent by 2050. Additionally, conventional vehicle GHG emissions will need to improve substantially with continued reductions through 2050. This transformation requires consumer acceptance and demand for these new technologies. However, recent surveys of new car buyers in California indicate that only 20 percent of new car purchasers are aware that ZEV technologies are available for purchase today indicating much work needs to be done to increase public awareness.

The figure below is a scenario from ARB's Vision model showing the mix of vehicle technologies that would achieve the 2050 greenhouse gas emissions reductions target. It shows that nearly all new car sales would need to be fuel cell electric, battery electric or plug in hybrid by 2050 (dashed black line shows new car sales percentage).

Analysis of Problem

Light-duty vehicle technology on-road fleet expansion



Successfully commercializing light-duty ZEVs will support developing ZEV technologies in other mobile sectors such as off-road and heavy duty vehicles. As more battery electric and fuel cell vehicles are brought to market, the industry improves drivetrain, power plant and energy storage systems and costs are reduced with larger scale production and growing supply chain. Implementing zero-emission technologies in other sectors will have even greater impact on meeting air quality and climate goals.

Growing the ZEV market beyond California is also important because additional markets help increase volumes, bring down costs, and increase consumer acceptance. California has signed agreements with other states implementing the ZEV regulation and with other leading international jurisdictions to cooperate in the advancement of the ZEV market. This proposal will support that effort with staffing to engage with our partners to create common standards, share best practices, and solve technical and implementation challenges.

California is a leader in the effort to commercialize ZEVs. The federal government supports our leadership, describing the state as an incubator for technology, but does not plan to require automakers to produce ZEVs to comply with national vehicle standards.

E. Outcomes and Accountability

The addition of personnel to the ACC program will allow for the timely development and adoption of the next iteration of the regulations necessary to meet the light duty share of the emissions reductions targets. Additionally, personnel will be available to implement complementary programs to enhance and ensure market acceptance of new vehicle technologies at the rate necessary to achieve the regulatory requirements.

The AREs and APSs will work closely with an Air Resources Supervisor I and the ARB management team and deadlines will be set for each major task needed to accomplish the objectives of the ACC program.

F. Analysis of All Feasible Alternatives

Analysis of Problem

Alternative No. 1: The best alternative is this proposal, for the requested personnel as outlined in this BCP. This request provides for the full development and implementation of the ACC Program to support the objectives of the upcoming SIP, soon to be updated Scoping Plan and Executive Orders 16-12 and B-30-15.

Alternative No. 2: A second available scenario is to wait until after the mid-term review at the end of 2016 to build up resources for development of the next phase of the ACC program, delaying addition of personnel to the 2018/2019 fiscal year. This approach has two significant disadvantages. Regulations applicable to the 2026 model year must be adopted with sufficient lead time for automakers to prepare for the new requirement. To avoid loss of an implementation year, staff must present the ACC amendments for post 2025 in 2020. The robust regulatory proposal requires three plus years to develop, therefore staff should be added to the program no later than 2017. Additionally, with the borrowed and temporary staff being released from the ACC program team at the culmination of the mid-term review in 2016, any delay would cause a significant gap resulting in failure to transfer knowledge between existing staff and new staff. ARB would incur further cost and time to bring new staff up to speed.

Alternative No. 3: A third alternative would be to cover the workload identified with existing resources. This approach would require continued reassignment of staff from existing programs causing workload backlog and delayed implementation of programs like updating regulations for on- and off-road motorcycles heavy-duty diesel in-use testing program, light-duty diesel studies, light-duty vehicle compliance programs, and off-road in-use compliance testing.

Alternative No. 4: A fourth alternative is to work closely with the federal government to attempt to achieve national standards for light duty vehicles that meet California's air quality and greenhouse gas emissions reductions targets. If this was successful, California may not need to adopt separate, more stringent emissions regulations. This effort would require immediate reassignment of staff and management resources to engage with federal government agencies, necessitating similar staffing requirements as outlined above. Reliance on this strategy for the needed emissions reductions would be high risk. The federal government while committed to reducing criteria pollutant and greenhouse gas emission reductions has not committed to ZEV commercialization via regulatory means and does not appear poised to do so in the future. California needs to commercialize ZEVs in order to achieve the reductions necessary to meet air quality and greenhouse gas targets. Additionally, even if federal regulatory standards were adopted, California would still need to engage in rigorous implementation efforts to ensure successful market growth. This would still require additional personnel.

G. Implementation Plan

In the budget year new staff would be hired and trained in regulatory development and technology assessment. In 2017/2018 the technical staff would begin testing programs, data gathering and analysis. In 2018/2019 these staff would begin the synthesis of technical information into draft regulatory proposals to be presented to impacted stakeholders through meetings and workshops. Along with additional technical information gathering through 2019, staff would prepare full regulatory packages including the Initial Statement of Reasons reports, economic analysis and environmental analysis (California Environmental Quality Act) in preparation for Board consideration in 2020. Subsequent to Board adoption these staff will finalize the regulations, develop implementation, reporting and tracking programs and continue to assess and monitor the progress of the regulations with periodic reports to the Board and regulatory amendments as needed in future years.

For the staff tasked with complementary program development in the budget year they would be hired and trained in ZEV technology and market development activities. In the subsequent years they would be assigned to develop, implement and assess effectiveness of fueling infrastructure and public awareness and acceptance of ZEV technologies. They would also coordinate with other jurisdictions (states that have adopted the California ZEV regulation, ZEV leader countries and sub-national jurisdictions California has cooperation agreements with) to develop and share best practices, assess market development, solve technical and implementation challenges and establish national and international standards related to the ZEV market. The results of this work would also be periodically reported to the Board as part of the overall regular assessment of ACC implementation.

Analysis of Problem

H. Supplemental Information

None.

I. Recommendation

Alternative Number 1 is the best option and is recommended. The additional staff resources will enable development and implementation of necessary regulations to achieve emissions reductions from light duty vehicles post 2026 and ensure the goals of Executive Orders B-16-12 and B-30-15 are fulfilled.

Air Resources Board				Attachment A Workload Justification		
Fund:						
Position Title: Air Resources Engineer 1 - ACC Technology						
Workload Measure	FY 2016-17			FY 2017-18		
Description of task	Number of Times the task was performed	Number of hours needed to complete task	Total number of annual hours	Number of times the task was performed	Number of hours needed to complete task	Total number of annual hours
Research technology status, evaluate cost, durability and performance. Track technology penetration.	1	630	630	1	630	630
Manage test programs to ascertain technology emissions and durability performance	1	540	540	1	540	540
Write reports for periodic review of regulations	1	270	270	1	270	270
Meetings with stakeholders, management	48	3	144	48	3	144
Board presentations	2	18	36	2	18	36
Regulation, report writing, economic and environmental analysis	1	180	180	1	180	180
Total Hours			1,800			1,800

1.0 Position Equivalent = 1,800 hours

Numbers are based on previous workload experience

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Air Resources Board				Attachment A Workload Justification		
Fund:						
Position Title:		Air Resources Engineer 2 - ZEV Infrastructure				
Workload Measure		FY 2016-17			FY 2017-18	
Description of task	Number of Times the task was performed	Number of hours needed to complete task	Total number of annual hours	Number of times the task was performed	Number of hours needed to complete task	Total number of annual hours
Infrastructure technology analysis (cost, functionality, durability, location coverage)	1	810	810	1	810	810
report writing	1	360	360	1	360	360
Board presentations on status of ZEV Infrastructure	1	18	18	1	18	18
Support and consultaiton with other agencies in development of standards needed in ZEV infratructure	12	51	612	12	51	612
Total Hours			1,800			1,800

1.0 Position Equivalent = 1,800 hours

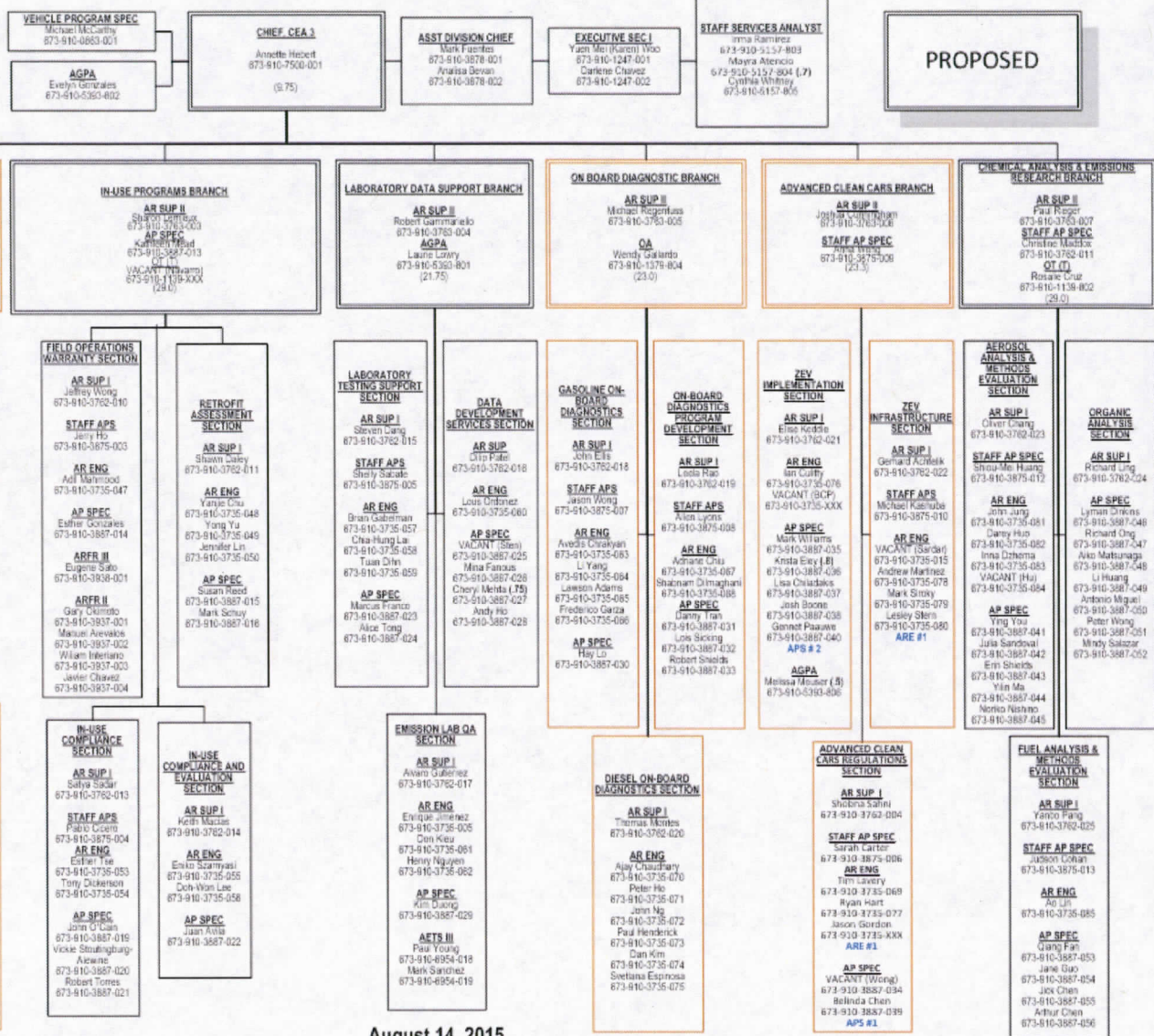
Numbers are based on previous workload experience

Air Resources Board				Attachment A Workload Justification		
Fund:						
Position Title: Air Pollution Specialist 1 and 2 - Market Analysis & External Coordination						
Workload Measure	FY 2016-17			FY 2017-18		
Description of task	Number of Times the task was performed	Number of hours needed to complete task	Total number of annual hours	Number of times the task was performed	Number of hours needed to complete task	Total number of annual hours
Conduct market analysis using survey tools administered through CVRP and other sources. Assess education and outreach tools	2	270	540	2	250	500
compile and publish ZEV education materials to websites.	12	75	900	12	75	900
Organize and carry out education activities including dealership education, ride and drives and outreach events	12	60	720	16	60	960
write reports on market progress and effectiveness of education efforts	4	45	180	4	40	160
coordination and partnership with stakeholders, especially car makers, infrastructure providers, utilities	6	30	180	6	30	180
Meet with S177 states to coordinate implementation of multi-state MOU and ZEV Action Plan	20	4.5	90	10	4.5	45
Produce summaries of California programs, contribute to jointly developed best practices, standards and guidance documents with S177 states	6	45	270	6	45	270
facilitate coordination between Ca agencies and other states in topic areas such as energy policy, infrastructure deployment and fleet purchases.	10	27	270	5	27	135
Participate in International ZEV Alliance providing support for working groups in the form of compiling information from partner jurisdictions, development of joint best practices documents and briefing other partners on California programs	6	45	270	6	45	270
Report writing, report editing	2	45	90	2	45	90
Board presentations, management briefings	2	45	90	2	45	90
Total Hours			3600			3600

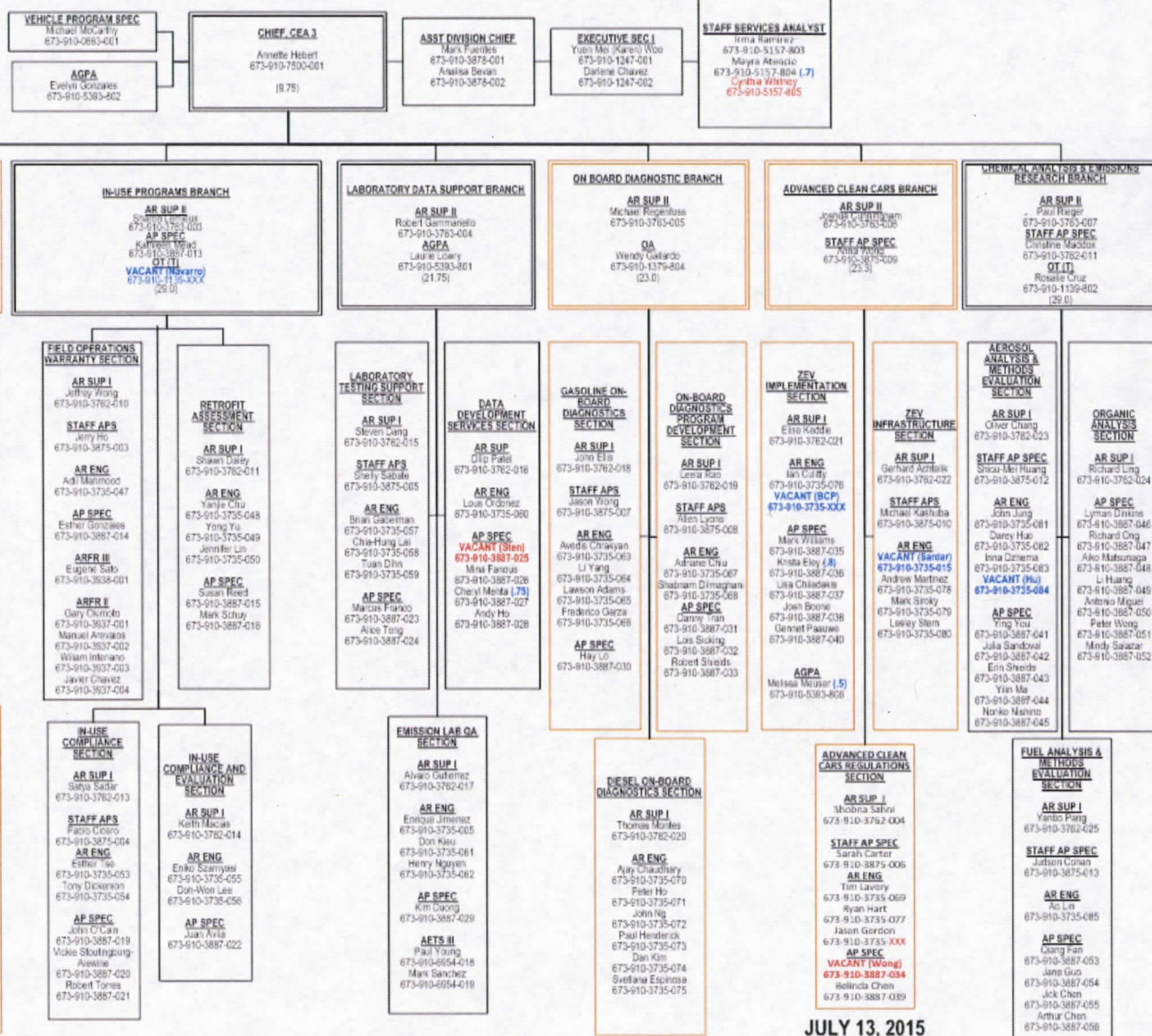
1.0 Position Equivalent = 1,800 hours

Numbers are based on previous workload experience

AIR RESOURCES BOARD EMISSIONS COMPLIANCE, AUTOMOTIVE REGULATIONS AND SCIENCE DIVISION



AIR RESOURCES BOARD EMISSIONS COMPLIANCE, AUTOMOTIVE REGULATIONS AND SCIENCE DIVISION



BCP Fiscal Detail Sheet

BCP Title: Advanced Clean Car Program

DP Name: 3900-004-BCP-DP-2016-GB

Budget Request Summary

	FY16					
	CY	BY	BY+1	BY+2	BY+3	BY+4
Positions - Permanent	0.0	4.0	4.0	4.0	4.0	4.0
Total Positions	0.0	4.0	4.0	4.0	4.0	4.0
Salaries and Wages						
Earnings - Permanent	0	330	330	330	330	330
Total Salaries and Wages	\$0	\$330	\$330	\$330	\$330	\$330
Total Staff Benefits	0	154	154	154	154	154
Total Personal Services	\$0	\$484	\$484	\$484	\$484	\$484
Operating Expenses and Equipment						
5301 - General Expense	0	8	8	8	8	8
5302 - Printing	0	4	4	4	4	4
5304 - Communications	0	8	8	8	8	8
5320 - Travel: In-State	0	16	16	16	16	16
5322 - Training	0	4	4	4	4	4
5324 - Facilities Operation	0	40	40	40	40	40
5346 - Information Technology	0	16	12	12	12	12
Total Operating Expenses and Equipment	\$0	\$96	\$92	\$92	\$92	\$92
Total Budget Request	\$0	\$580	\$576	\$576	\$576	\$576

Fund Summary

Fund Source - State Operations						
3237 - Cost of Implementation Account, Air	0	580	576	576	576	576
Total State Operations Expenditures	\$0	\$580	\$576	\$576	\$576	\$576
Total All Funds	\$0	\$580	\$576	\$576	\$576	\$576

Program Summary

Program Funding						
3510 - Climate Change	0	580	576	576	576	576
Total All Programs	\$0	\$580	\$576	\$576	\$576	\$576